

Remarks

Further and favorable reconsideration is respectfully requested in view of the foregoing amendments and following remarks.

Claim 1 has been amended to recite that the solid reagent reacts stoichiometrically with a starting compound by contact with the starting compound to transfer the starting compound into a target organic compound. Support for this amendment can be found on page 4, lines 15-26 of the specification.

New claim 34 has been added to the application, reciting that the solid reagent is consumed along the progress of the reaction to undergo changes in functional groups and thus lose reactivity as a reagent, and the solid reagent may recover its reactivity by restoring the functional groups with a regenerant. Support for this amendment is also found on page 4, lines 15-26 of the specification.

Initially, the Examiner states that a complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action. However, the present Office Action does not constitute a final rejection. Furthermore, Applicants respectfully request reconsideration of the restriction requirement, on the basis that, upon allowance of the elected claims, the non-elected claims should be rejoined with the elected claims, as effectively being directed to use of the solid reagent of the elected claims. MPEP 821.04 states that if Applicant elects claims directed to the product, and a product claim is subsequently found allowable, withdrawn process claims which depend from or otherwise include all the limitations of the allowable product claim will be rejoined. Therefore, Applicants have identified claims 8-11 and 22-33 as withdrawn, rather than cancelling these claims.

The patentability of the present invention over the disclosures of the references relied upon by the Examiner in rejecting the claims will be apparent upon consideration of the following remarks.

Thus, the rejection of claims 1-7 and 12-21 under 35 U.S.C. §102(b) as being anticipated by Garnett et al., or JP '574, or Frey et al., or Sugo et al. is respectfully traversed.

As indicated above, Applicants have amended claim 1 to recite that the solid reagent reacts stoichiometrically with a starting compound by contact with the starting compound to transfer the starting compound into a target organic compound.

Garnett et al. (U.S. 3,880,736) discloses a process for the graft polymerization of a vinyl pyridine monomer onto a backbone polymer. However, Garnett et al. do not teach or suggest that the grafted polymer is a "solid reagent" as defined in Applicants' amended claim 1.

JP 7041574 discloses the grafting of chloromethylstyrene onto a polymer base. However, although JP '574 teaches that the grafted polymer is used as a material for absorbing anions present in water, the reference does not teach or suggest a solid reagent that reacts stoichiometrically with a starting compound by contact with the starting compound to transfer the starting compound into a target organic compound, as required in Applicants' amended claim 1.

Frey et al. (U.S. 5,863,654) disclose a biocompatible porous fiber made of a grafted polyolefin material. Frey et al. teach that the grafted material is used for providing exchange materials, diaphragms and/or semipermeable membrane and the like. (See column 1, lines 26-42.) However, Frey et al. do not teach or suggest a solid reagent that reacts stoichiometrically with a starting compound by contact with the starting compound to transfer the starting compound into a target organic compound, as required in Applicants' amended claim 1.

Sugo et al. (U.S. 5,648,400) disclose an ion exchange resin composed of a grafted polymer material. However, Sugo et al. do not teach or suggest a solid reagent, as defined in Applicants' amended claim 1. An ion exchange resin is quite different from a solid reagent that reacts stoichiometrically with a starting compound by contact with the starting compound to transfer the starting compound into a target organic compound.

The solid reagent according to the present invention has the following advantages. First, the solid reagent of the present invention, as set forth in amended claim 1, makes it possible to increase diffusion speed of the starting compound or regenerant, while keeping the physical strength of the polymer backbone, by locating a polymer side chain on the polymer backbone of an uncrosslinked organic polymer base and introducing a reactive functional group onto the polymer side chain. Thus, the solid reagent of the present invention allows the reaction to

proceed at a higher flow rate than previously, thereby increasing the efficiency of the process. Additionally, the solid reagent of the present invention greatly improves reaction efficiency or regeneration efficiency because the polymer side chain has high mobility due to the absence of crosslinked structure. This permits easy access of the starting compound or regenerant to any site of the polymer side chain at which the reactive functional group has been introduced, and permits easy recovery of the product after the reaction. (See page 9, line 6 - page 10, line 35 of the specification.)

None of the references cited by the Examiner teach or suggest a solid reagent as defined in amended claim 1. Additionally, none of the cited references disclose the advantages of Applicants' claimed solid reagent, as discussed above.

Additionally, since claims 2-7 and 12-21 are directly or indirectly dependent on claim 1, the subject matter of claims 2-7 and 12-21 is patentable over the cited references for the same reasons that the subject matter of claim 1 is patentable over these references.

For these reasons, the invention of claims 1-7 and 12-21 is clearly patentable over Garnett et al., JP '574, Frey et al., and Sugo et al.

The rejection of claims 1-7 and 12-21 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-5 of U.S. 6,703,432 is respectfully traversed. [It is noted that the Examiner included claim 22 in the rejection. However, claim 22 was indicated as withdrawn in item 4a of the Office Action Summary.]

The Examiner takes the position that although the conflicting claims are not identical, they are not patentably distinct from each other because the chemical formulation of a grafted polymer having a polymer side chain having a functional group in claims 1-5 of US '432 is readable on Applicants' claims. The Examiner further asserts that it would have been obvious to one of ordinary skill in the art to consider that the desiccant material in claims 1-5 of US '432 is a reactive solid agent because the polymer side chain has a cationic exchange group selected from sulfonate acid group, phosphate group, and carboxyl group.

However, although US '432 discloses a desiccant material which absorbs or desorbs moisture in gas, this is quite different from a solid reagent that reacts stoichiometrically with a

starting compound by contact with the starting compound to transfer the starting compound into a target organic compound, as required by Applicants' amended claim 1. Therefore, US '432 does not teach or suggest the limitations of Applicants' amended claim 1.

Additionally, since claims 2-7 and 12-21 are directly or indirectly dependent on claim 1, the subject matter of claims 2-7 and 12-21 is patentable over US '432 for the same reasons that the subject matter of claim 1 is patentable over this reference.

For these reasons, the invention of claims 1-7 and 12-21 is clearly patentable over US '432.

The rejection of claims 1-7 and 12-21 under 35 U.S.C. §101 as claiming the same invention as that of claims 1-25 of prior U.S. Patent 6,811,771 is respectfully traversed. [This rejection again incorrectly includes claim 22.]

US '771 discloses a bactericidal material, which functions by gradually releasing iodine. (See column 8, lines 3-7 of the reference.) Such a sustained-released material is quite different from a solid reagent that reacts stoichiometrically with a starting compound by contact with the starting compound to transfer the starting compound into a target organic compound, as required in Applicants' amended claim 1. Sustained release drugs are designed to gradually release functional group moieties without contact with a starting compound as its reaction partner. This distinction is discussed on page 4, lines 22-26 of Applicants' specification.

Therefore, the invention of claims 1-7 and 12-21 is clearly patentable over US '771.

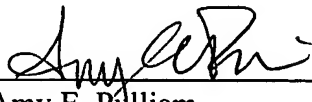
Further attention is directed to new claim 34. There is no teaching or suggestion in the applied references that the solid reagent is consumed along the progress of the reaction to undergo changes in functional groups and thus lose reactivity as a reagent, and the solid reagent may recover its reactivity by restoring the functional groups with a regenerant.

Therefore, in view of the foregoing amendments and remarks, it is submitted that each of the grounds of rejection set forth by the Examiner has been overcome, and that the application is in condition for allowance. Such allowance is solicited.

Respectfully submitted,

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